**Career Academy Integrated Unit Plan**

**Academy Name: STEM – Tech Issues**  **School: UHS \_**

**Date Created: 6/7/2011 Created by: J. Blinn, W. Lastowski, K. Lenhart \_**

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| Integrated Unit Plan Title: Forensics |
| Courses to integrate: Biology, Tech Issues, Geometry |
| Grade Level: 9 |
| Timeline & Duration: 25 days (starting at the beginning of each quarter) |

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| Unit Summary: Students will investigate how to gather and analyze evidence in a crime scene to prove their theories using a two column proof format. |

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| **Overview of Activities/Lessons per Course** | | | | |
| Course | Tech Issues | Biology | Geometry |  |
| Activity/Lesson | Knowledge acquisition of Crime | Bone identification | Intro to Proofs |  |
| Activity/Lesson | Culminating project – “Proofing Your Evidence” forensics expert testimony simulation | Physiology of fight or flight response. | Formal Proofs  Blood Spatter – Angle of Impact calculation |  |

**Lesson Instructions for Tech Issues :**

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| **Standards (Performance Tasks or Course Frameworks or Sunshine State Standards ): Complete Forensics unit**  **Rigor & Relevance (quadrant): Quadrant C** |
| **Instructions to Teacher:**  Prepare **Evidence Analysis Harbor** for knowledge acquisition- materials, artifacts, and worksheets |
| **Instructions to Students:**   1. Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to “prove” events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information. |
| **Instructions for Student Accommodations:**  Allow students to work with partners |
| **Assessment for Activity:**  Electronic assessment and Harbor Post Test |
| **Approximate Length of Time for Activity:**  25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – “Proofing Your Evidence” |
| **Materials Needed:**  Harbor materials for knowledge acquisition stage |
| **Resources Needed:**  FACES Composite program, Excel, human skeletal bones, Reading the Bones worksheet |
| Attachments: Student culminating project information sheets |

**Lesson Instructions for Tech Issues :**

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| **Standards (Performance Tasks or Course Frameworks or Sunshine State Standards ): Complete Forensics unit**  **Rigor & Relevance (quadrant): Quadrant C** |
| **Instructions to Teacher:**  Prepare **Crime Scene Harbor** for knowledge acquisition- materials, artifacts, and worksheets |
| **Instructions to Students:**  1) Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to “prove” events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information |
| **Instructions for Student Accommodations:**  Allow students to work with partners |
| **Assessment for Activity:**  Electronic assessment and Harbor Post Test |
| **Approximate Length of Time for Activity:**  25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – “Proofing Your Evidence” |
| **Materials Needed:**  Harbor materials for knowledge acquisition stage |
| **Resources Needed:**  FACES Composite program, Excel, human skeletal bones, Reading the Bones worksheet |
| Attachments: Student culminating project information sheets |

**Lesson Instructions for Tech Issues :**

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| **Standards (Performance Tasks or Course Frameworks or Sunshine State Standards ): Complete Forensics unit**  **Rigor & Relevance (quadrant): Quadrant C** |
| **Instructions to Teacher:**  Prepare **Crime Lab Harbor** for knowledge acquisition- materials, artifacts, and worksheets |
| **Instructions to Students:**   1. Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to “prove” events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information |
| **Instructions for Student Accommodations:**  Allow students to work with partners |
| **Assessment for Activity:**  Electronic assessment and Harbor Post Test |
| **Approximate Length of Time for Activity:**  25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – “Proofing Your Evidence” |
| **Materials Needed:**  Harbor materials for knowledge acquisition stage |
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**Lesson Instructions for Biology :**

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| **Standards (Performance Tasks or Course Frameworks or Sunshine State Standards ):**  **Rigor & Relevance (quadrant):SC.912.L.14.34 Describe the composition and physiology of blood, including that of the plasma and the formed elements. Other correlations with NGSSS will happen after the curriculum map revision of summer 2011 concludes.** |
| **Instructions to Teacher:**  Provide instruction via centers in classroom for the topics of physiology and composition blood, bone recognition, physiological changes the body during fight or flight response, |
| **Instructions to Students:**  Complete the information guides receive in the Tech Issues class by researching the topics in the centers in the Biology classroom and submit into Tech Issue Portfolio. Physiology and Composition of Blood, Fight or Flight Body Changes, Bone Recognition |
| **Instructions for Student Accommodations:**  Students assigned to same Harbor in Tech Issues can work together. |
| **Assessment for Activity:**  Student Tech Issues Portfolio additions of information guides Physiology and Composition of Blood, Fight or Flight Body Changes, Bone Recognition |
| **Approximate Length of Time for Activity:**  During 25 day integrated unit titled- “Proofing Your Evidence” |
| **Materials Needed:**  Student resource guides |
| **Resources Needed:**  Centers for student research in biology class on previously mentioned topics |
| Attachments: Student Information guides |

**Lesson Instructions for Geometry :**

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| **Standards: MA.912.T.2.1 Understand and define the trigonometric ratios (sine, cosine, tangent) as they relate to the angles of a right triangle.**  **MA.912.G.5.3/MA.912.G.5.4 Use a variety of methods involving right triangles to solve real-world problems including trigonometric ratios**  **Rigor & Relevance (quadrant): Quadrant C** |
| **Instructions to Teacher:** Short lesson on trigonometric ratios (not in depth, just an introduction) including SOH CAH TOA and how to use trig to analyze blood spatter. |
| **Instructions to Students:** Complete Blood Spatter worksheet |
| **Instructions for Student Accommodations:** Allow students to work in pairs or groups |
| **Assessment for Activity:** Answers to worksheet |
| **Approximate Length of Time for Activity:** 1 day (50 minute period) |
| **Materials Needed:** Compass, straight edge, calculator with sin functions |
| **Resources Needed:** Blood Spatter worksheet |
| Attachments: Blood Spatter Worksheet |

**Lesson Instructions for Geometry :**

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| **Standards:** MA.912.D.6.3/MA.912.6.4 Determine whether a given short proof is logically valid.  MA.912.G.8.2 Use a variety of problem solving strategies to include diagramming, charting, trial and error.  MA.912.G.8.3 Determine if a solution is reasonable based on the given situation  MA.912.G.8.4 Make conjectures and justify and support the conjectures with geometric proofs. Distinguish between information that supports a conjecture and the proof of a conjecture.  MA.912.G.8.5 Write geometric proofs. Use a variety of ways to present deductive proofs, such as two-column proofs.  **Rigor & Relevance (quadrant):** Quadrant C |
| **Instructions to Teacher:** Introduce the building blocks of proofs (including undefined terms, if then statements and two column proof structure) using Springboard Geometry Lesson 1-3. |
| **Instructions to Students:** Day 1: Complete Springboard: Back to the Beginning #1-4 (page 1 and 2)  Day 2: Back to the Beginning #5-6 (page 3 through 5)  Day 3: Back to the Beginning #7-10 (page 6 and 7) |
| **Instructions for Student Accommodations:** Allow students to work in pairs or groups |
| **Assessment for Activity:** Back to the Beginning: Check your understanding (page 8) |
| **Approximate Length of Time for Activity:** 3 days (50 minute periods) |
| **Materials Needed:** No special materials needed |
| **Resources Needed:** Springboard Geometry book or handouts |
| Attachments: Springboard pages |

**Lesson Instructions for Geometry :**

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| **Instructions to Teacher:** Remind students of the introduction to geometric proofs and emphasize how important showing each and every step is. Draw connections for the students between geometric proofs and proving guilt/innocence in a crime:  all evidence presented needs to support conclusion  all evidence must be considered  need to determine who the “culprit” is based on evidence  Provide students with notes and examples of two-column geometric proofs. Use textbook sections 2-5 and 2-6. |
| **Instructions to Students:** Complete practice proofs (geometric and practical) and evaluate other students’ proofs.  Day 1: Section 2-5 #1-13 odds, 14-41  Day 2: Section 2-6 #1-11 odd, 36-48  Day 3: Section 2-6 #13-35  Day 4: Additional practice proofs |
| **Instructions for Student Accommodations:** Work in pairs and small groups |
| **Assessment for Activity:** Chapter 2 Test |
| **Approximate Length of Time for Activity:** 3 – 4 days (50 minute periods) |
| **Materials Needed:** No special materials needed |
| **Resources Needed:** Geometry textbook, additional practice proofs |
| Attachments: Practice Proofs |